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VALUE ANALYSIS

PROGRAM MANUAL

MONTANA DEPARTMENT OF TRANSPORTATION
HELENA, MONTANA

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TABLE OF CONTENTS

PROGRAM VISION

Value Analysis is Recognized Throughout MDT as an Effective Tool for Continuous Improvement of the Quality and Value of our Products and Services.

PROGRAM MISSION

"Enhance Quality by Improving Value -- Through Teamwork and Synergy"

DEFINITION

Value Analysis is the systematic application of recognized techniques by multi-disciplined team(s) which identifies the function of a product or service; establishes a worth for that function; generates alternatives through the use of creative thinking; and provides the needed functions, reliably, at the lowest overall cost.

Value Analysis, also known as Value Engineering, consists of those tasks performed by a Value Analysis Team in accordance with this Value Analysis Program Manual.

For purposes of this manual, the word “project” will mean any product or service provided by MDT.

SECTION A – POLICY

The MDT Value Analysis (VA) Program will be implemented to provide a process for conducting formal value analysis of selected projects during the early phases of the project development process. The criteria used to select projects for the VA study process is outlined in this Value Analysis Program Manual. There are three phases of the project development process when a VA study could be performed:

- Preliminary Field Review
- Preliminary Alignment/Grade Review
- Scope of Work Report

If a project is selected for VA study at any one of these phases, results of the VA study should be implemented prior to continuing with the next phase in the typical project development process. If a project is not selected for VA study during any of these phases, the typical project development process will continue and normal plan reviews, constructability reviews and post construction reviews will be performed during the process. When a project has been selected for VA study, whether design is to be performed by the District, Preconstruction or by Consultant through Consultant Design Services, Activity #729 will be included in the OPX2 flow chart schedule and the CES Bureau will be the single point of contact and support for the VA study.

I. Value Analysis Process:

Scope Consensus Study - During the PFR process, the Preconstruction Engineer and Project Design Manager (PDM) may determine it advantageous to organize a one-day Scope Consensus Study to achieve an agreement between the involved parties as to what a particular project is to be. This study is a consensus meeting that utilizes the systematic approach and tools of the value analysis methodology to resolve scoping issues and build genuine consensus. PDMs are encouraged to use this approach on appropriate projects.

Construction Engineering Services (CES) Bureau should be notified when the Preconstruction Engineer and PDM recognize a significant consensus problem and decides to organize a scope consensus study. Working with the PDM, CES Bureau is responsible for organizing the study team, setting the meeting date and time and assembling appropriate documents. The study team will conduct a one-day study, make recommendations for the scope and recommend implementation procedures. CES Bureau will provide assistance to the PDM in organizing and conducting the meeting.

The team for this type of study will consist primarily of persons directly involved with development of the project that will be selected and organized by the PDM in conjunction with CES Bureau. The CES Bureau will provide appropriate materials, documents and training to the PDM and members of the scope consensus study team.

All MDT projects with an estimated construction cost of **$8.0 million** or more, and being of average or greater complexity, are considered candidates for a Value Analysis Study either during the Preliminary Field Review (PFR), Alignment/Grade Review Report or the Scope of Work Report stage of the project development process. The estimated construction cost used for the threshold will be the cost estimate developed during the PFR stage of the project or the latest

cost estimate for those projects that have progressed beyond the PFR stage. In addition, all projects of a complex nature should be nominated for VA study, regardless of estimated cost. The Preconstruction Engineer and PDM will determine, in conjunction with the CES Bureau, at which stage the VA study will be performed. See Section D-VI for a discussion of the procedures for the VA study.

The Value Analysis Team (VAT) for these studies will be composed primarily of staff not involved with development of the project and will be organized by the CES Bureau. The CES Bureau staff will lead and/or facilitate the study or arrange to contract for such services, where appropriate. CES Bureau will prepare a report of the study findings and, after consultation with the PDM, circulate the report to the appropriate MDT offices and managers for review. The CES Bureau will monitor the review process and advise the Preconstruction Engineer and PDM on those items that are recommended for incorporation in the project design. The PDM will implement the appropriate recommendations and advise the CES Bureau of the recommendations that will be implemented and provide disposition explanations for recommendations that are not implemented.

The process results will be conveyed to the VAT, other MDT offices and managers and entered into the VA database by the CES Bureau.

The PDM is responsible for contacting the CES Bureau to schedule a VA study at least one month in advance of the proposed study. The CES Bureau, in conjunction with the PDM, will determine the disciplines to be represented on the VAT. The PDM and members of the design team will present the project to the VAT, but will not typically participate as VAT members.

In addition to the cost and complexity thresholds noted herein, requests to nominate potential VA study projects should be initiated by the District Administrator, District Engineering Services Supervisor, Preconstruction Engineer, Construction Engineer or any MDT Bureau Chief on a quarterly basis. Initiation and preparation of the request should be completed in conjunction with the PDM and forwarded to the CES Bureau Chief in Helena. See Section D-IV of this manual, Procedure for Nominating and Selecting an MDT Project for VA Study.

More information on all aspects of the VA Program is contained in procedure documents available from the CES Bureau. The PDM should become familiar with the VA Program and consider it a powerful tool for consensus building, problem solving and cost saving, not as "inspection", "peer review" or “oversight”. The objective of the VA Program is to enhance quality by improving value.

II. Value Analysis Team (VAT):

The VAT, consisting of VA study trained/experienced MDT personnel, FHWA personnel, personnel from consultants or outside agencies, or some combination of these sources will perform the VA study. The PDM will coordinate with the CES Bureau and VAT, providing necessary background information and presenting the project details to the VAT for the VA study.

III. Project Design Manager Responsibilities:

The PDM, upon notification of the approval of a VA study, will compile appropriate data for the study and make a presentation to the VAT in accordance with the Study Plan prepared by the CES Bureau. The PDM will communicate and cooperate with the CES Bureau and the VAT.

It is anticipated that the elements necessary for a VA study can be assembled and delivered by the PDM with minimum expenditure of effort and time in accordance with normal design procedures in approximately ten (10) working days. The PDM will be allowed to budget forty labor-hours for data compilation, the presentation and study response, if appropriate. If the PDM is requested to furnish a project design team representative to participate as a member of the VAT, additional labor hours may be necessary. Although costs for VA study activities are not identified as a separate expense item for accounting purposes, the PDM should obtain a special charge number from Accounting for tracking these costs and report the hours expended and estimated costs of labor and materials to the CES Bureau for cost tracking and VA Program evaluation purposes.

In accordance with the Value Analysis Program Manual, the findings and recommendations of the VA study will be forwarded to the Preconstruction Engineer and PDM for review. The PDM will review the VA study recommendations with the project design team and respond to the CES Bureau as soon as practical indicating acceptance, possible acceptance pending further investigation, or rejection of each recommendation. The PDM will implement the approved recommendations of the VA study. If significant additional design effort is required as a result of the VA study for Consultant design projects and the work is not in the approved Scope of Services, the additional work will be added to the Scope of Services by contract modification.

SECTION B – COST ACCOUNTING PROCEDURES

I. Objective:

These procedures will provide for the accounting of all significant costs associated with the VA Program. This accounting will facilitate administration of the VA Program and a comparison of benefits to costs.

II. Applicability:

These procedures are applicable to all MDT and Consultant personnel who expend work hours on a VA study activity that is administered under the VA Program. Work-hours devoted to similar activities, not administered under the VA Program, should not be charged in accordance with these procedures.

III. Types of Costs:

The personnel costs of the VA Program are of three basic types:

A. Study Costs

1. Designer Preparation and Presentation.
2. VAT Costs.
3. Management/Designer Review and Response. *****

B. Training Costs

C. Administrative Costs

*** Note:** MDT and Consultant personnel costs will be considered VA Program costs up to the point that study recommendations have been reviewed and either accepted or rejected by MDT. MDT personnel costs incurred beyond this point will be considered part of the normal design costs. If significant additional MDT or Consultant design costs are required to implement accepted recommendations, they will be noted in the VA study report and deducted from the savings associated with the study recommendations.

IV. Cost Accounting - MDT Employees:

A. General - CES Bureau will provide Project numbers and work hour budget information to the VAT.
B. Study of Established Project - Charge project number plus special account code.
C. All other Studies - Charge a special project number provided plus special account code.
D. Training - Charge to Organization Center overhead account code (R1111).
E. Administrative - Charge to Organization Center overhead account code. Administrative charges are for general program activities only. (All charges associated with a specific VA study must have a project number.)

V. Cost Accounting - Consultant Personnel:

A. Management Consultant costs associated with a VA study will be considered part of the ordinary management cost and will not be accounted for separately.
B. Design Consultant contracts that contain a work hour budget for VA. These work-hours are to cover study preparation, presentation and response costs to the point that study recommendations are either accepted or rejected by MDT. The Consultant will provide an accounting of incurred costs to the Consultant Design Bureau upon completion of this work. Consultant Design Bureau will provide these costs to the CES bureau for cost tracking purposes.
C. Independent Consultant personnel (not involved in the development of a project), required for a VA study, will be procured and compensated by means of a Letter Agreement administered by the Consultant Design Bureau.

SECTION C - FEDERAL VALUE ENGINEERING REGULATIONS

Authority: 23 U.S.C. 106(d), 106(f), 302, 307, and 315; 49 CFR 18.

§627.1 Purpose and Applicability

(a) This regulation will establish a program to improve project quality, reduce project costs, foster innovation, eliminate unnecessary and costly design elements, and ensure efficient investments by requiring the application of value engineering (VE) [Value Analysis] to all Federal Aid highway projects on the National Highway System (NHS) with an estimated cost of $25 million or more.
(b) In accordance with the Federal-State relationship established under the Federal Aid highway program, State highway agencies (SHA) shall assure that a VE analysis has been performed on all applicable projects and that all resulting, approved recommendations are incorporated into the plans, specifications and estimate.

§627.3 Definitions

Project - A portion of a highway that a State proposes to construct, reconstruct, or improve as described in the preliminary design report or applicable environmental document. A project may consist of several contracts or phases over several years.
Value Engineering [Value Analysis] - The systematic application of recognized techniques by a multi-disciplined team to identify the function of a product or service, establish a worth for that function, generate alternatives through the use of creative thinking, and provide the needed functions to accomplish the original purpose of the project, reliably, and at the lowest life-cycle cost without sacrificing safety, necessary quality and environmental attributes of the project.

§627.5 General Principles and Procedures

(a) State VE Programs - State highway agencies must establish programs to assure that VE studies are performed on all Federal Aid highway projects on the NHS with an estimated cost of $25 million or more. Program procedures should provide for the identification of candidate projects for VE studies early in the development of the State's multi-year Statewide Transportation Improvement Program.

(1) Project Selection - The program may, at the State's discretion, establish specific criteria and guidelines for selecting other highway projects for VE studies.

(2) Studies - VE studies shall follow the widely recognized systematic problem-solving analysis process that is used throughout private industry and governmental agencies. Studies must be performed using multi-disciplined teams of individuals not personally involved in the design of the project. Study teams should consist of a team leader and individuals from different specialty areas, such as design, construction, environment, planning, maintenance, right-of-way, and other areas depending upon the type of project being reviewed. Individuals from the public and other agencies may also be included on the team when their inclusion is found to be in the public interest.

(i) Each team leader should be trained and knowledgeable in VE techniques and be able to serve as the coordinator and facilitator of the team.
(ii) Studies should be employed as early as possible in the project development or design process so that accepted VE recommendations can be implemented without delaying the progress of the project.

(iii) Studies should conclude with a formal report outlining the study team's recommendations for improving the project and reducing its overall cost.

(3) Recommendations - The program should include procedures to approve or reject recommendations and ensure the prompt review of VE recommendations by offices and managers whose specialty areas are implicated in proposed changes and by offices responsible for implementing accepted recommendations. Reviews by these offices and managers should be performed promptly to minimize delays to the project.

(4) Monitoring - The program should include procedures for monitoring the implementation of VE study team recommendations and VE change proposal recommendations submitted by construction contractors.

(b) State VE Coordinators - Individuals knowledgeable in VE shall be assigned responsibilities to coordinate and monitor the SHA's program and be actively involved in all phases of the program.

(c) Use of Consultants - Consultants or firms with experience in VE may be retained by SHAs to conduct the studies of Federal Aid highway projects or elements of Federal Aid highway projects required under §627.1(a) of this part. Consultants or firms should not be retained to conduct studies of their own designs unless they maintain separate and distinct organizational separation of their VE and design sections.

(d) Funding Eligibility - The cost of performing VE studies is project related and is, therefore, eligible for reimbursement with Federal Aid highway funds at the appropriate pro-rata share for the project studied.

SECTION D - VALUE ANALYSIS PROGRAM GUIDELINES

I. Scope:

A. All MDT VA study activities will be conducted in accordance with these Guidelines.

B. Study activities of a similar nature that may be performed by MDT employees or consultants but that are not in accordance with these Guidelines, will not be referred to as "value analysis" or "value engineering." This will avoid confusion about the VA Program.

II. Administration:

A. The CES Bureau will administer the program under the direction of the Construction Engineer. The CES Bureau is located in Helena MDT Offices, Room 203, 2701 Prospect, (406) 444-6001.

B. CES Bureau will develop appropriate administrative procedures and documents and will maintain the program files. CES Bureau will also develop a VA library and database. The database will contain information about resources available within MDT as well as technical resources available elsewhere.

III. Study Selection:

A. As stated in this Value Analysis Program Manual, "A Value Analysis Study will be performed for all MDT projects with an estimated construction cost of $8.0 million or more and being of average or greater complexity either during the Preliminary Field Review (PFR), Alignment/Grade Review Report or Scope of Work Report stage of the project development process." "In addition, all highly complex projects should be considered for VA study, regardless of the project's estimated cost."

B. MDT has also established this program to assure that VA studies are performed on all Federal Aid highway projects on the National Highway System (NHS) with an estimated cost of $25 million or more (includes all costs of PE, CE, CN, R/W and IC). Program procedures provide for the identification, nomination and selection of candidate projects for VA studies early in the project development process. This would occur in January each year after final approval of the annual Tentative Construction Plan (TCP) [Red Book Planning] when the State's multi-year Statewide Transportation Improvement Program is reviewed and updated.

C. Since the VA study process can be applied to other subjects, any MDT project, standard, specification, procedure or material requirement may be proposed for a VA study. Anyone can, and is encouraged to suggest subjects to be nominated for VA study.

IV. Procedure for Nominating and Selecting an MDT Project for VA Study:

Introduction

Value Analysis is the systematic application of recognized techniques by multi-disciplined team(s) which identifies the function of a product or service; establishes a worth for that function; generates alternatives through the use of creative thinking; and provides the needed functions, reliably, at the lowest overall cost.

For purposes of this procedure, the word "project" will mean any product or service provided by MDT.

It is anticipated that the number of projects nominated for VA studies each year will exceed MDT's capabilities to perform the studies. Therefore, the procedure outlined herein provides for nominating, prioritizing and select potential projects for VA studies.

Projects may be nominated for VA study using two methods:

METHOD #1 – Nomination, review and selection by the Project Screening Committee (PSC) at a meeting in January each year after final approval of the annual TCP (Red Book Planning) stage.

MEHTOD #2 – Nomination by any MDT employee with review and selection by the Project Screening Committee (PSC) at a quarterly meeting.

Method #1 - Nomination By PSC

Prior to the January meeting, the PDM will provide the PSC the following information:

- Project name, number, control number and brief description.
- Latest cost estimate. For program or process type study nomination requests, provide the estimated annual dollar amount impacted by the process or program.
- Identify the project's current stage in the Project Development Process (PFR, A&G, SOW, PIH). For program or process type study nomination requests, describe any preliminary investigation or analysis work performed to date related to the program or process.
- List all available information related to the project that would be available to the VA Study Team (environmental document, reports, preliminary plans and cross sections, cost estimate, etc.)
- Outline the reasons why a VA study may be appropriate for the project and anticipated goals and objectives to be achieved by the study. Include an explanation of any political, environmental, technical, cost or quality issues associated with the project.

Method #2 - Nomination By MDT Employee

Any MDT employee can, and is encouraged to nominate projects for VA study through the designated position outlined under the Nomination section of this procedure.

Requests to nominate potential VA study projects should be initiated by the District Administrator, District Engineering Services Supervisor, Preconstruction Engineer, Construction Engineer or any MDT Bureau Chief on a quarterly basis. Initiation and preparation of the request should be completed in conjunction with the PDM and forwarded to the Construction Engineering Services (CES) Bureau Chief in Helena.

Requests should include the following information:

- Project name, number, control number and brief description.
- Latest cost estimate. For program or process type study nomination requests, provide the estimated annual dollar amount impacted by the process or program.
- Identify the project's current stage in the Project Development Process (PFR, A&G, SOW, PIH). For program or process type study nomination requests, describe any preliminary investigation or analysis work performed to date related to the program or process.
- List all available information related to the project that would be available to the VA Study Team (environmental document, reports, preliminary plans and cross sections, cost estimate, etc.)
- Outline the reasons why a VA study may be appropriate for the project and anticipated goals and objectives to be achieved by the study. Include an explanation of any political, environmental, technical, cost or quality issues associated with the project.

Project Selection For Both Nomination Methods

A Project Screening Committee (PSC) comprised of the Construction Engineer (who will serve as Chairperson), Chief Engineer, Preconstruction Engineer, Highways Engineer, CES Bureau Chief, two appropriate Bureau Chiefs appointed by the Construction Engineer and two FHWA representatives will meet in January each year after final approval of the annual TCP (Red Book Planning) to review and select Method #1 project nominations and near the end of each calendar quarter, if necessary, to review and select Method #2 projects nominated during the calendar quarter. The Value Analysis Engineer will be a non-voting member and will serve as Recording Secretary at all meetings.

The PSC will evaluate and score each nominated project based on the following Scoring Guide and VA Project Nomination Evaluation Criteria Scoring Sheet.

SCORING GUIDE

Each evaluation criteria is assigned a Scoring Weight and the PSC will rank each project by criteria on a 0 to 10 scale, with 10 being best. The PSC will consider the following guidelines when determining the ranking score for each criteria.

Very Good Response (8.5-10.0): A very good response will be a highly comprehensive and detailed response that meets all requirements of the nomination procedure and addresses all areas within each specific criteria. The response includes additional information, justifications and recommendations that would prove both valuable and beneficial to the PSC. This response is considered to be an excellent standard, demonstrating a thorough knowledge and understanding of the subject matter outlined in the criteria.

Good Response (6.5-8.4): A good response meets all the requirements of the nomination procedure and demonstrates in a clear and concise manner a thorough knowledge and understanding of the subject matter outlined in the criteria. This response demonstrates an above average performance with no apparent deficiencies noted.

Fair Response (5.0-6.4): A fair response meets the requirements of the nomination procedure in an adequate manner. This response demonstrates an ability to comply with nomination guidelines, parameters, and requirements with no additional information put forth by the nominator.

Poor Response (0-4.9): A poor response minimally meets the requirements of the nomination procedure. The nominator has demonstrated knowledge of the subject matter only as outlined in the criteria.

EVALUATION CRITERIA

The PSC will review and evaluate the request for each nominated project according to the following criteria based on a maximum possible value of 7,200 points. Projects receiving a total evaluation score of less than 3,500 points will not be eligible for a VA study.

VA PROJECT NOMINATION EVALUATION CRITERIA SCORING SHEET

Project No.: _____ Control No.: _____

Project Name: _____

EVALUATION CRITERIA NO.	DESCRIPTION	SCORING WEIGHT	RANKING	TOTAL SCORE	REMARKS
1	Provide project name, number, control number and brief description.	50			
2	Provide latest cost estimate. For program or process type study nomination requests, provide the estimated annual dollar amount impacted by the process or program.	150			
3	Identify project's current stage in the Project Development Process (PFR, A&G, SOW, PIH). For program or process type study nomination requests, describe any preliminary investigation or analysis work performed to date related to the program or process.	100			
4	List all available information related to the project that would be available to the VA Study Team (environmental document, reports, preliminary plans and cross sections, cost estimate, etc.).	200			
5	Outline the reasons why a VA study may be appropriate for the project and anticipated goals and objectives to be achieved by the study. Include an explanation of any political, environmental, technical, cost or quality issues associated with the project.	300			
GRAND TOTAL SCORE = _____					

PSC Member: _____ Date: _____

After the PSC has evaluated and scored each nominated project, the Value Analysis Engineer will document the PSC scores and final decision for Method #1 nominated projects and notify the nominator for Method #2 nominated projects in writing of the decision. For those projects selected for VA study by the PSC for the year and during each calendar quarter, the Value Analysis Engineer will coordinate with the PDM and the CES Bureau Chief to initiate the VA study process. For those Method #2 nominated projects not selected for VA study during each calendar quarter, the written notification will also include a copy of each PSC member's VA Project Nomination Evaluation Criteria Scoring Sheet. For those Method #2 nominated projects not selected for VA study during a calendar quarter, if the project schedule permits, the nominator may request that the project be re-considered during the next quarterly PSC meeting.

V. Team Selection:

A. The VAT will normally consist of 5-7 VA study trained and experienced persons, selected from throughout MDT. Some VAT may be supplemented with one or more FHWA representative and Consultant employees.

B. CES Bureau will maintain a roster of employees with VA study training and experience. The roster will also indicate the number of studies participated in by an employee.

C. Once a project is selected for a VA study, the CES Bureau, in conjunction with the PDM, will determine the disciplines needed on the VAT and will contact the appropriate representative of the various Bureaus, Sections and Districts to request one or more team members from the roster. It will be the Bureau, Section and District responsibility to approve which employee(s) will be assigned to the VAT. However, when a specific expertise is required, the CES Bureau may request a specific employee.

VI. Study Procedure:

A. VA studies will normally require 4-5 days of full-time effort by the entire team. The time allotted for each study will be determined in advance. Instead of 4 to 5 consecutive days, some studies will be conducted as a series of sessions, with the team determining the dates and frequency of meetings.

B. The CES Bureau will secure an appropriate location for each study and will maintain a roster of available space within MDT facilities. Most studies will be held in Helena, but other locations may be used, if appropriate.

C. The CES Bureau will prepare a Study Plan and distribute it in advance to each VAT member. The Study Plan will contain information about the scope of the study, logistics and VAT preparation. The CES Bureau will also make arrangements with the PDM and others for the pertinent documents to be made available to the VAT at the beginning of the study.

D. The CES Bureau will select a VAT leader in advance of starting the study.

E. The CES Bureau will arrange for a brief presentation or discussion by the PDM, or designee, at the beginning of the study. A project site visit is desirable, when feasible.

F. The completed VA Study Workbook will constitute the VA Study Report and will be completed by the CES Bureau within ten business days following completion of the study. The report will be sent to the Preconstruction Engineer and PDM for review and comment. VAT members will also receive a copy for review and comment.

VII. Review and Implementation:

Primary review of the VA Study Report will be conducted by the PDM, and if required, will seek assistance from technical groups. Resolution of study recommendations should be a consensus-building effort between the two teams, facilitated by the CES Bureau. Escalation, if required, will be to the Construction Engineer and Preconstruction Engineer.

VIII. Reports:

A. The CES Bureau will prepare an Annual Report for each fiscal year that will summarize the activities, achievements, problems, costs and cost-benefit of the VA Program.

B. The CES Bureau will prepare Progress Reports on a monthly basis. These reports will track each study through the preparation, review and implementation phases.

C. Periodically, VA Program related articles will be prepared for inclusion in the Interchange newsletter for general distribution throughout MDT. The articles will focus on disseminating information about the VA Program and increasing general awareness of the VA process.

IX. Training:

A. Periodically, the 40-hour FHWA/NHI Value Engineering Workshop course (#134005A), or its equivalent, will be offered for MDT employees. Twenty to thirty participants can be accommodated in each course.

B. Several positions on each VAT will normally be filled by untrained MDT employees. This "on-the-job training" will result in numerous additional MDT employees gaining VA study experience each year. These employees would still be candidates for the 40-hour workshop course.

C. Periodically, CES Bureau will offer MDT and FHWA employees a 40-hour VA Team Training course based on the FHWA/NHI Value Engineering Workshop course (#134005A). Ten to twelve participants can be accommodated in each course.

SECTION E - TEAM MEMBER PREPARATION GUIDE

I. Introduction:

Congratulations! You have been selected to serve on a Value Analysis Study Team. We are sure that you will find this experience to be both rewarding and enjoyable. You will spend several days working intensively and creatively with a group of your peers. Regardless of the results of the particular study, you will gain a better understanding of the perspectives of your teammates and of the complexities of highway design and project development.

II. Preparation:

VA studies normally require three to four consecutive days and may require intermittent time during another two days. Please make every effort to clear your calendar and delegate as needed, so that you will be able to concentrate fully on the study. This will not only enhance the experience, but will also help your teammates. Should you have a problem in this regard, please contact the CES Bureau as soon as possible.

You will receive a brief Study Plan in advance of the study, either at the same time you receive this Manual, or soon after. The Study Plan contains background, scope and logistical information about the proposed study. Sometimes it will include one or more attachments that will provide a brief description of the study subject or project. Often these are excerpts from documents that will be available during the study. When reading these excerpts, note which documents you want to review more thoroughly during the first phase of the study. It is not intended that you to spend more than an hour or two preparing for the study. You are encouraged to bring appropriate resources with you to the study. Keep in mind that VA is by nature an intensive, time-constrained procedure. Therefore, bring only familiar resources that you can refer to quickly and accurately. Phone numbers of sales engineers/representatives and other contact persons may also be helpful. Bring your own calculator, computer, notepaper, pencils and other supplies.

If you have questions prior to the study, contact the CES Bureau for clarification. Do not directly contact the PDM or members of the project design team.

Some things to consider regarding VAT:

- A team is not just created by merely by bringing 5-7 people together in the same room. Each member needs to make it happen.
- Check your "agendas" at the door and maintain your respect and trust of other teammates.
- Approach the study with a positive attitude.
- Teams sometimes tend to slip into "war story" sessions during a study. Sometimes these may help with team building and provide useful information, but they can also waste a lot of valuable time.
- The "Abilene Paradox" describes a situation where everyone on a team agrees to something that no one really supports. Each member assumes that the other members are in favor, so they go along. More typically, you will observe a similar situation when one or two team members support an idea and the rest, who do not, go along anyway for various reasons. Do not go to Abilene! If you cannot "buy in" to what is being proposed, it is your responsibility to speak up. It is also your responsibility to help the team achieve true consensus. Consensus may require compromise, but do not compromise until you have expressed your views. Value Analysis is not about quotas, peer review or design review. The role of the team is to "search for the second right answer", not to find fault.
- Work hard and enjoy the experience.
- It is most important that each team member trust and follow the methodology. It has been used successfully around the world for over 30 years.

III. Value Analysis Team Leader:

The VAT leader is responsible for overall conduct of the study. The VAT leader will either be a member of the CES Bureau VA Section staff or be selected by the CES Bureau. VAT leaders receive significant training in VA prior to service. Experienced Consultant or FHWA VAT leaders may be utilized to lead some of the more complex studies or when MDT staff is not available. They will typically be "Certified Value Specialists" who do this work as a vocation. The role of a VAT member will be the same, regardless of who serves as VAT leader.

Because of the intensive and structured nature of the value analysis method, good teamwork and "group dynamics" are essential parts of a successful study. There will be plenty of opportunity for everyone to contribute during each phase, but the VAT leader may have to "move things along" or spread the conversation around, in order to be sure everyone participates and the goals of the study are met. Give the VAT leader your maximum cooperation during the study process.

IV. The Study:

VA studies typically consist of six phases:

1. Identification of Potential
2. Analysis of Functions
3. Generation of Ideas
4. Evaluation of Ideas
5. Development of Recommendations
6. Presentation of Recommendations

The proportion of the total study time that is spent on each phase will vary, but each phase will be a distinct part of the total effort.

1. Identification of Potential - During this phase, the VAT will identify those elements of the project that are most likely to yield value improvement. Use various techniques such as Cost Modeling, FAST Diagramming or Failure (Problem) Analysis in combination with the team's professional judgment to make these decisions. Once the VAT has selected those elements with the greatest potential, concentrate exclusively on them for the remainder of the study.

2. Analysis of Functions - Function analysis is really the "heart and soul" of value analysis. During this phase the VAT will analyze each selected element in order to determine its basic and secondary functions. The VAT leader will conduct a brief overview of this process before it begins. The most important thing to remember is that function analysis is a means to an end, not the end itself. It is a process that allows a multi-discipline team to achieve consensus of the needed functions, in preparation for generating ideas about how best to provide those functions. There are no absolutely correct function analysis solutions, but getting there is the most important result. An important tool in function analysis is the FAST diagram. Think of it as a critical path of functions, rather than activities. It is a logic diagram that helps the VAT understand the project and also search for function problems.

3. Idea Generation - This phase is typically known as "brainstorming". Once the VAT understands the functions of the project, it must think creatively as individuals and as a team, to generate ideas. There are several "rules" for brainstorming:

- Do not brainstorm until this phase is reached. If an idea surfaces during earlier phases, write it down and bring it up later. Early discussion of solutions tends to inhibit a thorough understanding of the issues.
- When this phase is reached, do not hold back. No idea is too weird or wacky during brainstorming. Do not pre-judge or dismiss anything and write them all down. A “far-out” idea, when focused on by a team, may generate a very feasible idea.
- Do not just sit there waiting for ideas to surface. Think hard and concentrate on the functions, not the existing solutions. Concentrate on other ideas and attempt to build on them. Someone has likened this experience to pearl diving, the more oysters you collect, the more likely you are to find a pearl.

4. Evaluation of Ideas - During this phase, reduce the list of ideas to those most feasible by analyzing advantages and disadvantages. In some cases, compare alternatives with a "matrix" approach and use life cycle cost techniques. Compared to the more "free wheeling" phases that precede it, this phase may seem somewhat tedious, but it is no less important to a successful study.

5. Development of Recommendations – This phase will vary significantly from study to study. It involves the advancement of VAT ideas to the level of recommendations that can be presented, and to some extent, defended. Development of recommendations can include the preparation of sketches, calculations, graphics and reports, as well as making contacts to obtain additional information. The VAT will be responsible for determining the extent of the Development phase for the study, based on the nature of the ideas and recommendations, and on time constraints. Although the entire VAT will contribute to a written report, the report will be completed and distributed by the CES Bureau.

6. Presentation of Recommendations - The most important aspect of this step is to Sell, Sell and Sell the recommendations. This can be accomplished by: 1) Developing a written proposal; 2) Use PowerPoint, flip charts, overheads or any other medium for presentations; 3) Speculate on potential roadblocks to acceptance and be prepared to address; 4) Only present recommended alternatives. When preparing the presentation, ask the following questions to keep the presentation focused, concise and clear:

- Who must be convinced?
- How should the idea be presented?
- What was the problem?
- What is the new way?
- What are the benefits to be gained?
- What are the losses to be avoided?
- What are the savings?
- What is needed to implement the proposal?

V. After The Study:

Once the study work is completed, the VAT work is done. The VA Program includes a formal review process and the VAT recommendations will receive careful consideration. If after the PDM review is completed and there are unresolved issues, a Two-VAT Review may be held. If this occurs, the PDM and members of the project design team and VAT meet and decide on each recommendation, then move on. No new issues are addressed, unless both sides agree that there is adequate time and justification to analyze them. The implementation of accepted recommendations will be monitored by the CES Bureau in order to avoid misunderstandings and also to record any changes in recommendations and/or benefits received. The goal is to keep all VAT members informed of significant events during this process, that can sometimes last several years until design and construction of the project is completed. If any VAT members thinks they might be "out of the loop", contact the CES Bureau immediately.

VI. Conclusion:

This document is intended to assist VAT members prepare for participation in a VA study and is intentionally brief. VAT members are encouraged to contact their VAT leader or the CES Bureau with any questions or suggestions.

SECTION F - PROJECT STUDY AGENDA

(Guide Only)

DAY 1
8:00-8:15 Introductions, Warm-Up
8:15-9:30 Kick-Off Meeting (VA Study Overview and Design Presentation)
9:30-11:15 Individual Study of Project Documents – (VAT Members)
11:15-11:30 Tentative Element List – (VAT)
11:30-12:30 Lunch
12:30-2:00 FAST Diagram/Cost Model – (VAT)
2:00-3:30 Individual Study of Project Documents - (VAT)
3:30-4:30 Consensus on Elements to Analyze – (VAT)

DAY 2
8:00-10:30 Function Analysis of Elements – (VAT)
10:30-11:30 Brainstorming – (VAT)
11:30-12:30 Lunch
12:30-2:00 Brainstorming Continues – (VAT)
2:00-3:00 Narrowing – (VAT)
3:00-4:30 Advantages/Disadvantages – (VAT)

DAY 3
8:00-9:00 Consensus on Ideas to Retain – (VAT)
9:00-3:30 Evaluation and Development of Recommendations – (Sub teams)
3:30-4:30 Consensus on Recommendations and Wrap-Up – (VAT)

DAY 4
VAT Presentation

SECTION G - PROJECT DESIGN MANAGER'S GUIDE

I. Introduction:

This brief guide is intended for MDT and Consultant PDM whose projects are scheduled for a VA study in the near future. It attempts to clarify the PDM responsibilities regarding the VA study. It is suggested that the PDM add the CES Bureau to the mailing list once the project is identified for a VA study. All contact prior to and after the VA study will be between the PDM and the CES Bureau only and there should be no direct contact with members of the VAT. Contact during the VA study will be handled on a case-by-case basis, set up during the Design Presentation.

When the project is a Consultant design, the CES Bureau will send this guide to the Consultant Design Bureau. The information contained herein should be conveyed to the Consultant PDM in a manner determined by the Consultant Design Bureau. There will be no formal relationship between the Consultant and the CES Bureau. The CES Bureau will not contact the Consultant directly unless approved by the Consultant Design Bureau.

II. Consultant Scope of Services:

The generic scope of services for Consultant projects should contain a "boilerplate" section on VA. This guide will supplement the information contained in the scope of services. For some projects, a special VA study section may be included in the scope of services.

III. Value Analysis Study Scope:

The ideal situation for a VA study is one where the entire project is open for analysis by the VAT. It is assumed that each new VA study is unconstrained, unless otherwise stipulated. It is the PDM responsibility to obtain approval from the Construction Engineer and the Preconstruction Engineer for development of any constraints that are required for a particular project. A description of the approved constraints should be sent to the CES Bureau and the VAT will be advised accordingly. Otherwise, the VAT will only be constrained by the applicable AASHTO and MDT standards, FHWA requirements, good engineering judgment and a consideration of life cycle costs.

IV. Team Composition:

The CES Bureau is responsible for assembling the VAT, but the PDM is encouraged to offer suggestions as to disciplines or individuals.

V. Preparation:

The CES Bureau will contact the PDM to discuss the documents required for the VA study. Each VA study is different, but generally, the following documents are required:

Quantity	Description
4	Half size sets of plans
4	Sets of cross-sections
4	Copies of latest Cost Estimate
1	Copy of all available studies and reports (Traffic, Drainage, Structures and Environmental)
1	Any videotapes and photographs
1	Aerial photograph, if available
4	Sets of Special Provisions, if available
1	Available Graphics (Mounted, colored plans, etc.)

The CES Bureau is responsible for obtaining an appropriate location for the VA study. For Consultant design projects, a request to use the Consultant's conference room may be made. This has proven to be very convenient for both the Consultant and the VAT, but is not mandatory.

VI. Design Presentation:

Normally a "kick-off" meeting occurs at the start of each VA study, at which time the PDM or a member of the project design team conducts a brief presentation of the project. Depending on the complexity of the project, one to two hours is usually sufficient for this process. The PDM is responsible for scheduling and determining whom will conduct the presentation and what information will be presented to the VAT.

VII. VAT Presentation:

At the conclusion of a VA study, the VAT may give a brief presentation of its findings and recommendations. The CES Bureau and the PDM will determine content, to whom and when the presentation will be made.

VIII. Study Review:

The Preconstruction Engineer and PDM will receive a report within 10 working days following completion of the VA study. The PDM should review the VA Study Report and recommendations and respond to the CES Bureau as soon as possible. The goal of the review process is a consensus resolution by both teams. After the PDM review and comments are received, and if certain issues are unresolved, a Two-VAT Review may be conducted. The PDM, project design team and VAT members meet, decide on each recommendation, and then move on. No new issues are introduced-unless both teams agree that there is adequate time and justification to analyze them. Escalation to the Construction Engineer and Preconstruction Engineer should be considered only when an impasse occurs. The CES Bureau will generally remain neutral, in a facilitation role, during this process. The CES Bureau will become involved if it appears that a significant recommendation that has merit may be lost without appropriate consideration.

IX. Value Analysis Costs:

The following VA costs should be identified:

1. Consultant Preparation, including the project design team presentation.
2. Consultant participation in cases where the design Consultant is a VAT member or spends a significant amount of time with the VAT.
3. Consultant Review, as required and coordinated by the PDM. (Note: MDT review costs are not tracked).
4. VAT Member Costs – MDT or VA Consultant are tracked by the CES Bureau using Activity # 066.
5. Cost to implement accepted VA recommendations. These costs are normally "netted-out" against the cost-saving resulting from the recommendation in the VA study.

The goal is to keep an approximate accounting of significant VA Program costs. At the end of the VA Study Report review period, the PDM should provide a reasonable estimate of costs for Numbers 1, 2, and 3 to the CES Bureau. Any implementation costs (Number 5) will normally be estimated during the study in order to facilitate decision-making related to the recommendations.

X. Implementation:

In some cases, the implementation of approved recommendations takes place over a significant period of time. It is also possible that a change of conditions in the future may increase or decrease the acceptability and effect of a VA study recommendation. In these cases, it is the CES Bureau responsibility to monitor the project. As in preparation for the VA study, the PDM will be the single point of contact for this process. The PDM should advise the CES Bureau of significant events that may affect the outcome of a VA study recommendation.

XI. Conclusion:

This guide is an attempt to make VA studies as "painless" as possible for busy PDM. PDM and others are encouraged `to contact the CES Bureau with any questions or suggestions.